What is claimed is:

1   1.   A method of encoding a sequence of bits for transmission via
2   a transmission channel as symbols consisting of a plurality of
3   bits, some of the bit positions of the symbols having a higher
4   bit error rate than other bit positions, the method comprising:

5   a)   a step (31, 32, 41, 42) of providing a plurality of
6   sequences of bits using a convolutional encoder (31, 41), in
7   response to a sequence of input bits, each sequence of bits being
8   defined by a predetermined generator polynomial having a
9   predetermined level of sensitivity to puncturing; and

10   b)   a step (33, 44) of mapping the bits of each sequence of
11   bits to symbol positions based on the level of sensitivity of
12   the generator polynomial defining the sequence of bits.

1   2.   A method of decoding a sequence of bits encoded for
2   transmission via a transmission channel as symbols consisting of
3   a plurality of bits, some of the bit positions of the symbols
4   having a higher bit error rate than other bit positions, the
5   method comprising:

6   a)   a step (36, 45), responsive to received symbols, of
7   demapping the symbols back to a plurality of sequences of bits,
8   each sequence of bits being defined by a predetermined generator
9   polynomial having a predetermined level of sensitivity to
10   puncturing, the demapping based on the level of sensitivity of a
11   generator polynomial defining a respective one of the sequences
12   of bits; and

13   b)   a step (37, 38, 47, 48), responsive to the plurality of
14   sequences of bits, of providing outputs bits using a
15   convolutional decoder (38 48).

1   3. A method as in claim 1, further comprising a step (34, 43) of
2   interleaving.

1   4. A method as in claim 2, further comprising a step (35, 46) of
2   deinterleaving.

1   5. A method as in claim 3, wherein the interleaving (43) is bit
2   interleaving, and wherein the step (44) of providing a mapping is
3   performed after the step (43) of bit interleaving.

1   6. A method as in claim 4, wherein the deinterleaving (46) is
2   bit deinterleaving, and wherein the step (45) of demapping is
3   performed before the step (46) of bit deinterleaving.

1   7. A method as in claim 3, wherein the interleaving (34) is
2   symbol interleaving, and wherein the step (33) of providing a
3   mapping is performed before the step (34) of symbol interleaving.

1   8. A method as in claim 4, wherein the deinterleaving (35) is
2   symbol deinterleaving, and wherein the step (36) of demapping is
3   performed after the step (35) of symbol deinterleaving.

1   9. A method as in claim 3, wherein, in the step (31, 32, 41, 42)
2   of providing a plurality of sequences of bits using a
3   convolutional encoder (31, 41), at least one of the sequences of
4   bits are punctured (32, 42) after using the convolutional encoder
5   (31, 41) in order to fit the at least one sequence of bits into a
6   transmission channel.

1   10. A method as in claim 9, wherein the amount of puncturing
2   (32, 42) of each sequence depends on the level of sensitivity of

3   the polynomial defining the sequence.

1   11. A method as in claim 1, wherein, in the step (31, 32, 41,
2   42) of providing a plurality of sequences of bits using a
3   convolutional encoder (31, 41), at least one of the sequences of
4   bits are punctured (32, 42) after using the convolutional encoder
5   (31, 41) in order to fit the at least one sequence of bits into a
6   transmission channel.

1   12. A method as in claim 1, wherein, in the step (37, 38, 47,
2   48) of providing output bits from the plurality of sequences of
3   bits, punctured bits are inserted (37, 47) into at least one of
4   the sequences of bits before using the convolutional decoder (38,
5   48).

1   13. A method as in claim 11, further comprising a step (34, 43)
2   of interleaving.

1   14. A method as in claim 13, wherein the interleaving (43) is
2   bit interleaving, and wherein the step (44) of providing a
3   mapping is performed after the step (43) of bit interleaving.

1   15. A method as in claim 13, wherein the interleaving (34) is
2   symbol interleaving, and wherein the step (33) of providing a
3   mapping is performed before the step (34) of symbol interleaving.

1   16. A method as in claim 11, wherein the amount of puncturing
2   (32, 42) of each sequence depends on the level of sensitivity of
3   the polynomial defining the sequence.

1   17. A transmitting apparatus for encoding a sequence of bits for
2   transmission via a transmission channel as symbols consisting of

3   a plurality of bits, some of the bit positions of the symbols
4   having a higher bit error rate than other bit positions, the
5   apparatus comprising:

6   a)   means (31, 32, 41, 42) for providing a plurality of
7   sequences of bits using a convolutional encoder (31, 41), in
8   response to a sequence of input bits, each sequence of bits being
9   defined by a predetermined generator polynomial having a
10 predetermined level of sensitivity to puncturing; and

11 b)   means (33, 44) for mapping the bits of each sequence of
12 bits to symbol positions based on the level of sensitivity of
13 the generator polynomial defining the sequence of bits.

1   18.   A receiving apparatus for decoding a sequence of bits
2   encoded for transmission via a transmission channel as symbols
3   consisting of a plurality of bits, some of the bit positions of
4   the symbols having a higher bit error rate than other bit
5   positions, the apparatus comprising:

6   a)   means (36, 45), responsive to received symbols, for
7   demapping the symbols back to a plurality of sequences of bits,
8   each sequence of bits being defined by a predetermined generator
9   polynomial having a predetermined level of sensitivity to
10 puncturing, the demapping based on the level of sensitivity of a
11 generator polynomial defining a respective one of the sequences
12 of bits; and

13 b)   means (37, 38, 47, 48), responsive to the plurality of
14 sequences of bits, for providing outputs bits using a
15 convolutional decoder (38 48).

1   19.   A transmitting apparatus as in claim 17, further comprising
2   means (34, 43) for interleaving.

1   20.   A receiving apparatus as in claim 18, further comprising
2   means (35, 46) for deinterleaving.

1   21.   A transmitting apparatus as in claim 19, wherein the means
2   (43) for interleaving performs bit interleaving, and wherein the
3   means (44) for mapping is operative after the means (43) for
4   interleaving.

1   22.   A receiving apparatus as in claim 20, wherein the means (46)
2   for deinterleaving is bit deinterleaving, and wherein the means
3   (45) for demapping is performed before the step (46) of bit
4   deinterleaving.

1   23.   A transmitting apparatus as in claim 19, wherein the means
2   (34) for interleaving performs symbol interleaving, and wherein
3   the means (33) for providing a mapping is operative before the
4   means (34) for interleaving.

1   24.   A receiving apparatus as in claim 20, wherein the means (35)
2   for deinterleaving performs symbol deinterleaving, and wherein
3   the means (36) for demapping is operative after the means (35)
4   for deinterleaving.

1   25.   A transmitting apparatus as in claim 19, wherein, the means
2   (31, 32, 41, 42) for providing a plurality of sequences of bits
3   using a convolutional encoder (31, 41) includes, after the
4   convolutional encoder (31, 41), means (32, 42) for puncturing at
5   least one of the sequences of bits in order to fit the at least
6   one sequence of bits into a transmission channel.

1   26.   A transmitting apparatus as in claim 25, wherein the means

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2   for puncturing (32, 42) provides puncturing of each sequence in
3   an amount that depends on the level of sensitivity of the
4   polynomial defining the sequence.

1   27. A transmitting apparatus as in claim 17, wherein, the means
2   (31, 32, 41, 42) for providing a plurality of sequences of bits
3   using a convolutional encoder (31, 41) includes, after the
4   convolutional encoder (31, 41), means (32, 42) for puncturing at
5   least one of the sequences of bits in order to fit the at least
6   one sequence of bits into a transmission channel.

1   28. A receiving apparatus as in claim 18, wherein, the means
2   (37, 38, 47, 48) for providing output bits using a convolutional
3   decoder (38, 48) includes, before the convolutional decoder (38,
4   48), means (37, 47) for inserting bits into at least one of the
5   sequences of bits.

1   29. A transmitting apparatus as in claim 27, further comprising
2   means (34, 43) for interleaving.

1   30. A transmitting apparatus as in claim 29, wherein the means
2   (43) for interleaving performs bit interleaving, and wherein the
3   means (44) for providing a mapping is operative after the means
4   (43) for interleaving.

1   31. A transmitting apparatus as in claim 29, wherein the means
2   (34) for interleaving performs symbol interleaving, and wherein
3   the means (33) for providing a mapping is operative before the
4   means (34) for interleaving.

1   32. A transmitting apparatus as in claim 27, wherein the means
2   for puncturing (32, 42) provides puncturing of each sequence in

3   an amount that depends on the level of sensitivity of the

4   polynomial defining the sequence.

1   33.   A system for wireless communication, comprising a base

2   station and a mobile station, wherein either the base station or

3   the mobile station includes a transmitting apparatus as claimed

4   in claim 17.

1   34.   A system for wireless communication, comprising a base

2   station and a mobile station, wherein either the base station or

3   the mobile station includes a receiving apparatus as claimed in

4   claim 18.